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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,111	06/30/2003	Takahisa Kato	03500.017366	1040
5514	7590	09/22/2005	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			RICHARDS, N DREW	
30 ROCKEFELLER PLAZA			ART UNIT	PAPER NUMBER
NEW YORK, NY 10112			2815	

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,111

Applicant(s)

KATO ET AL.

Examiner

N. Drew Richards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-13 is/are pending in the application.
- 4a) Of the above claim(s) 12 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 9-11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/15/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/15/05 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Jerman (U.S. Patent No. 5,177,579).

Jerman discloses a microstructure in figure 6, for example, comprising:

a support substrate 81;

a movable plate 83; and

an elastic support portion comprising a first section 88 having at least one concave portion (the corrugations 88 define concave portions), and second sections having no concave portions, the second sections arranged at both longitudinal ends of

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the first section 88 and connecting with the movable plate 83 and the support substrate 81, respectively (the second section connected with the support substrate is labeled 86, the second section connected to the movable plate is not labeled but is shown as the solid straight portion of the layer to the left of the last corrugated section and to the right of the plate 83),

wherein a cross section of the concave portion in a vertical direction to a torsion axis has a substantially V-shape, and

wherein the movable plate 83 is supported by the elastic support portion so that the movable plate can be freely torsion-vibrated to the support substrate about a torsion axis (though Jerman does not explicitly disclose the plate 83 being torsion-vibrated, the structure is capable of being torsion vibrated and thus reads on the structure claimed).

With regard to claim 2, a length of the first section is not shorter than a half of the entire length of the elastic support portion in the torsion-axis direction.

With regard to claim 3, the first section has a third section in which a depth of the concave portion increases as approaching the center of the first sections along the torsion-axis direction, and wherein the third section connects with the second section. This is seen as the leftmost portion of corrugation 88 where the corrugation begins bending downward such that its depth increases.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jerman as applied to claims 1-3 and 8 above, and further in view of Shaw et al. (U.S. Patent No. 6,051,866).

Jerman teach their support substrate 81, elastic support portion 88, movable plate 83 and concave portion being integrally formed (figure 6 shows all structures formed from one piece of material). Jerman further teach that they are formed of silicon (column 9 line 16 and column 10 lines 40-61). Jerman does not teach the structures being formed of a single-crystal material as recited in claim 4. Nor does Jerman teach the single-crystal material being single-crystal silicon as recited in claim 5.

Shaw et al. teach a microelectromechanical structure in figure 7, for example, including a support substrate 154, an elastic support portion 52, and a movable plate 150. Shaw et al. teach forming these structures integrally from single-crystal silicon (abstract).

Jerman and Shaw et al. are combinable because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form the device of Jerman integrally from single-crystal silicon. The motivation for doing so is that single-crystal silicon has a higher breaking strength

and superior electrical properties (Shaw et al. column 1 lines 55-59). Therefore, it would have been obvious to combine Jerman with Shaw et al. to obtain the invention of claims 4 and 5.

With regard to claims 6 and 7, in combination (using single-crystal silicon for the device) the elastic support portion and the concave portion are constituted by equivalent planes of a silicon crystal plane. The elastic portion and concave portion have planar surfaces which necessarily define equivalent planes. It is noted that no specific plane is claimed.

Allowable Subject Matter

6. Claims 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments filed 8/15/05 have been fully considered but they are not persuasive.

Applicant has argued that Jerman fails to teach a first section of the elastic support having a concave portion and a cross section in a vertical direction to a torsion axis with a substantially V-shape. This is not persuasive. In Jerman, the movable plate 83 is able to be rotated in an upward and downward direction with regard to figure 6. In such a motion, the "torsion axis" is not the vertical or horizontal direction seen in the

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figure, but is the axis running into the page. Thus, taking this axis as the "torsion axis", a vertical direction to the torsion axis is the cross section shown in figure 6. In this cross section, the concave portion (each corrugation) in a vertical direction to the torsion axis has a substantially V-shape. Note that the torsion axis of Jerman is different than that of the instant invention, thus the V-shape of Jerman may be in a different plane than in the instant invention with regard to the longitudinal direction of the elastic support while still being in a vertical direction to the torsion axis.


Applicant also argues that the corrugations of Jerman do not support the beam member so it can be freely torsion-vibrated to the support substrate about the torsion axis. Applicant points out that Jerman teach the corrugations allowing for increased travel per unit of applied force. This is not persuasive. The corrugations do support the beam so that it can be freely torsion-vibrated. If the corrugations were not there, the beam member (movable plate) would not be held above the support substrate. If the movable plate was not held aloft it would not be free to torsion-vibrate as it would have nowhere to move in a downward direction. Holding the movable plate aloft allows the movable plate to be freely torsion-vibrated. Further, the fact that the corrugations allow for increase movement per applied force mererly shows that using the corrugations allow greater freedom in the movement, i.e. it is more freely movable. Thus, Jerman properly anticipates claims 1-3.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (571) 272-1736. The examiner can normally be reached on Monday-Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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